

Complementary MOSFET

SI1029X

■ Features

● N-Channel

$V_{DS} = 60V$, $I_D = 500mA$

$R_{DS(ON)} < 1.4 \Omega$ @ $V_{GS}=10V$

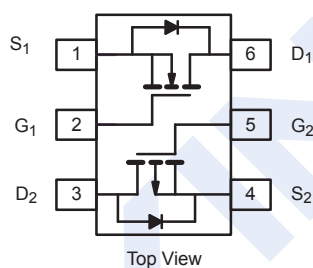
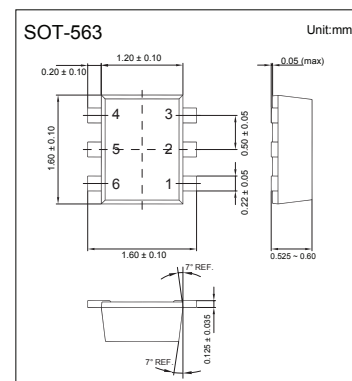
$R_{DS(ON)} < 3 \Omega$ @ $V_{GS}=4.5V$

● P-Channel

$V_{DS} = -60V$, $I_D = -500mA$

$R_{DS(ON)} < 4 \Omega$ @ $V_{GS}=-10V$

$R_{DS(ON)} < 8 \Omega$ @ $V_{GS}=-4.5V$

■ Absolute Maximum Ratings ($T_A = 25^\circ C$ Unless otherwise specified)

Parameter		Symbol	N-Channel		P-Channel		Unit
			5 s	Steady State	5 s	Steady State	
Drain-Source Voltage		V _{DS}	60		-60		V
Gate-Source Voltage		V _{GS}	± 20				
Continuous Drain Current (Note 1)	T _A =25°C	I _D	320	305	-200	-190	mA
	T _A =85°C		230	220	-145	-135	
Pulsed Drain Current (Note 2)		I _{DM}	650		-650		
Continuous Diode Conduction Current (Note 1)		I _S	450	380	-450	-380	
Maximum Power Dissipation (Note 1)	T _A =25°C	P _D	280	250	280	250	mW
	T _A =85°C		145	130	145	130	
Junction Temperature		T _J	150				°C
Storage Temperature Range		T _{stg}	-55 to 150				
Gate-Source ESD Rating - HBM		ESD	2000				V

Notes 1. Surface mounted on FR4 board.

2. Pulse width limited by maximum junction temperature.

SI1029X

■ Electrical Characteristics (T_J = 25°C Unless otherwise specified)

Parameter	Symbol	Test Conditions	Type	Min	Typ	Max	Unit
Static							
Drain-Source Breakdown Voltage	V _{DSS}	V _{GS} = 0 V, I _D = 10 μA	N-CH	60			V
		V _{GS} = 0 V, I _D = - 10 μA	P-CH	-60			
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 50 V, V _{GS} = 0 V	N-CH			10	nA
		V _{DS} = - 50 V, V _{GS} = 0 V	P-CH			-25	
		V _{DS} = 50 V, V _{GS} = 0 V, T _J = 85 °C	N-CH			100	
		V _{DS} = - 50 V, V _{GS} = 0 V, T _J = 85 °C	P-CH			-250	
Gate-Body Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 5 V	N-CH			±50	nA
			P-CH			±100	
		V _{DS} = 0 V, V _{GS} = ± 10 V	N-CH			±150	
			P-CH			±200	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	N-CH	1		2.5	V
		V _{DS} =V _{GS} , I _D =-250μA	P-CH	-1		-3.0	
On-State Drain Current (Note 1)	I _{D(on)}	V _{DS} = 10 V, V _{GS} = 4.5 V	N-CH	500			mA
		V _{DS} = - 10 V, V _{GS} = - 4.5 V	P-CH	-50			
		V _{DS} = 7.5 V, V _{GS} = 4.5 V	N-CH	800			
		V _{DS} = - 10 V, V _{GS} = - 10 V	P-CH	-600			
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 4.5 V, I _D = 200 mA	N-CH			3	Ω
		V _{GS} = - 4.5 V, I _D = - 25 mA	P-CH			8	
		V _{GS} = 10 V, I _D = 500 mA	N-CH			1.4	
		V _{GS} = - 10 V, I _D = - 500 mA	P-CH			4	
		V _{GS} = 10 V, I _D = 500 mA, T _J = 125 °C	N-CH			2.5	
		V _{GS} = - 10 V, I _D = - 500 mA, T _J = 125 °C	P-CH			6	
Forward Transconductance	g _{FS}	V _{DS} = 10 V, I _D = 200 mA	N-CH		200		mS
		V _{DS} = - 10 V, I _D = - 100 mA	P-CH		100		
Diode Forward Voltage	V _{SD}	I _S = 200 mA, V _{GS} = 0 V	N-CH			1.4	
		I _S = - 200 mA, V _{GS} = 0 V	P-CH			-1.4	V
Dynamic (Note 2)							
Input Capacitance	C _{iss}	N-Channel: V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz P-Channel: V _{DS} = - 25 V, V _{GS} = 0 V, f = 1 MHz	N-CH		30		pF
			P-CH		23		
Output Capacitance	C _{oss}		N-CH		6		
			P-CH		10		
Reverse Transfer Capacitance	C _{rss}		N-CH		3		
			P-CH		5		
Total Gate Charge	Q _g	N-Channel: V _{DS} = 10 V, V _{GS} = 4.5 V, I _D = 250 mA P-Channel: V _{DS} = - 30 V, V _{GS} = - 15 V, I _D = - 500 mA	N-CH		75		nC
			P-CH		1700		
Gate Source Charge	Q _{gs}		N-CH		75		
			P-CH		260		
Gate Drain Charge	Q _{gd}		N-CH		225		
			P-CH		460		
Turn-On Time (Note 3)	t _{d(on)}	N-Channel: V _{DD} = 30 V, R _L = 150 Ω, $\square$ I _D ≥ 200 mA, V _{GEN} = 10 V, R _g = 10 Ω P-Channel: V _{DD} = - 25 V, R _L = 150 Ω, I _D ≤ - 165 mA, V _{GEN} = - 10 V, R _g = 10 Ω	N-CH		15		ns
			P-CH		20		
Turn-Off Time (Note 3)	t _{d(off)}		N-CH		20		
			P-CH		35		

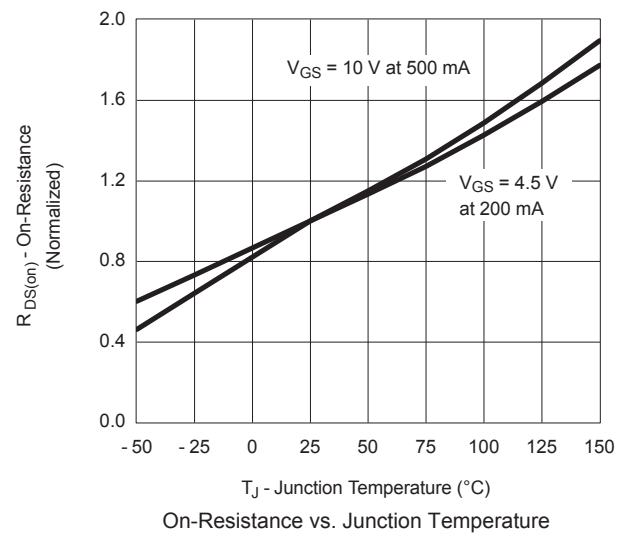
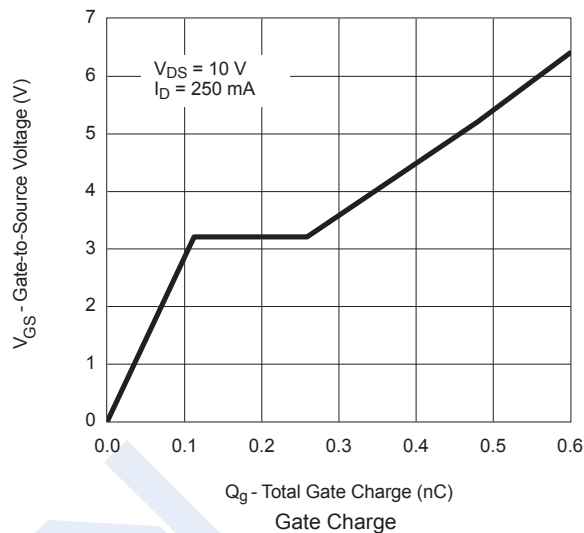
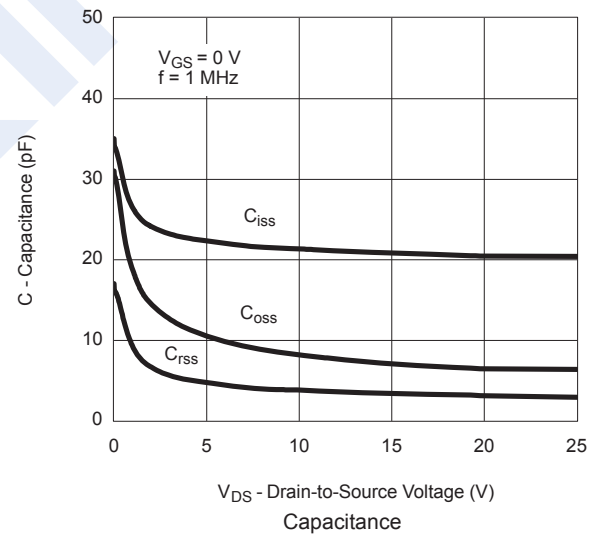
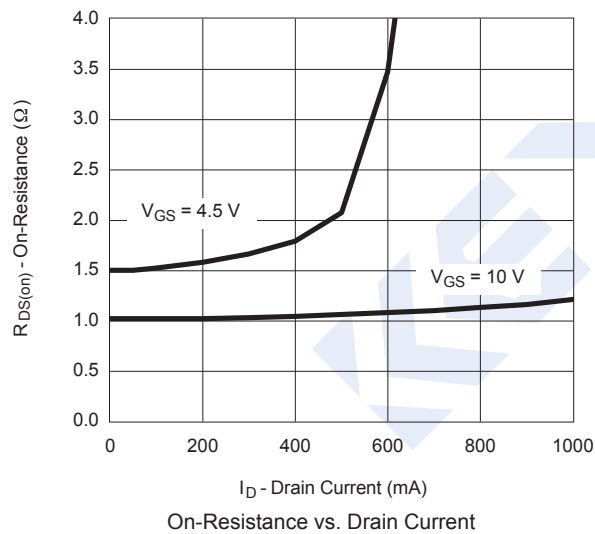
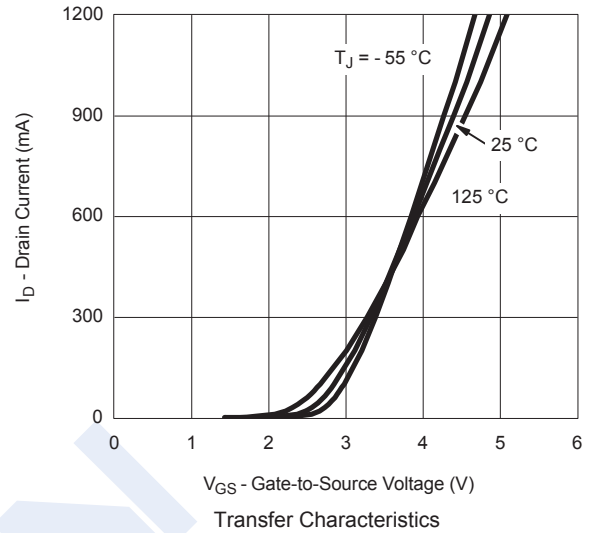
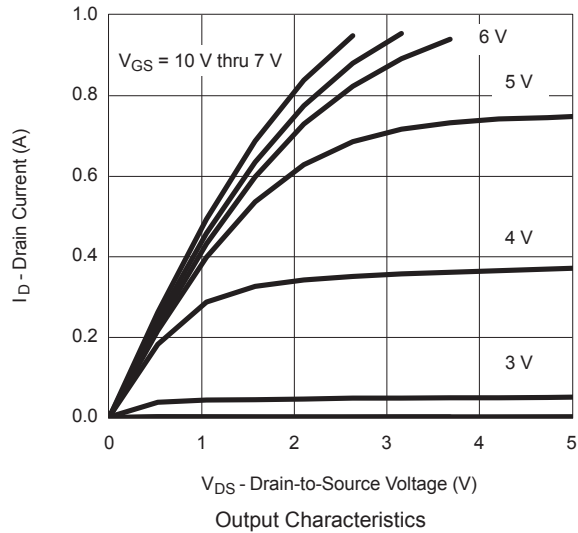
Notes 1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

2. Guaranteed by design, not subject to production.

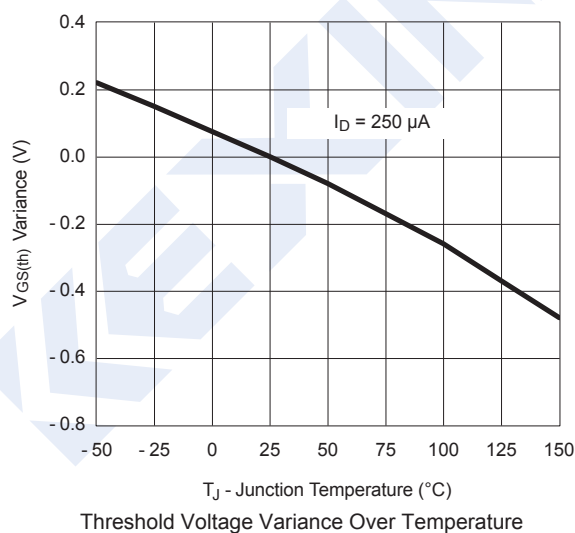
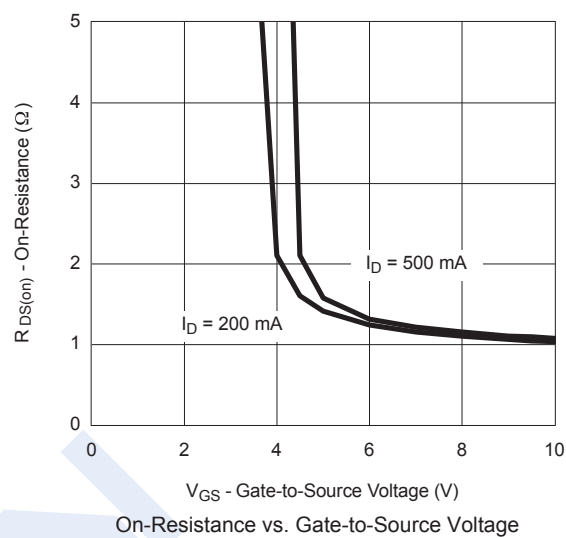
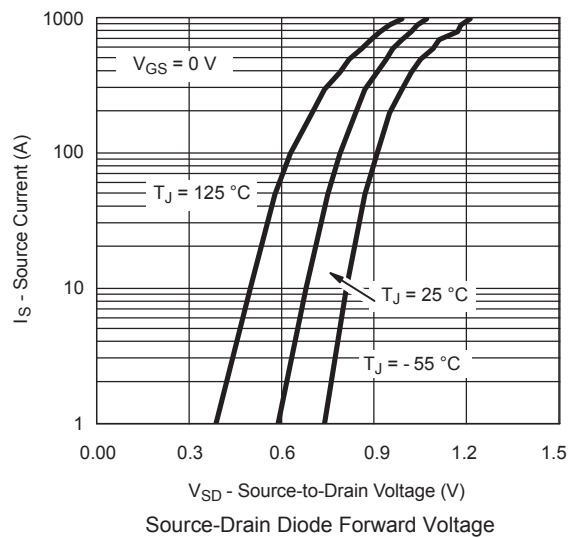
3. Switching time is essentially independent of operating temperature.

■ Marking: H

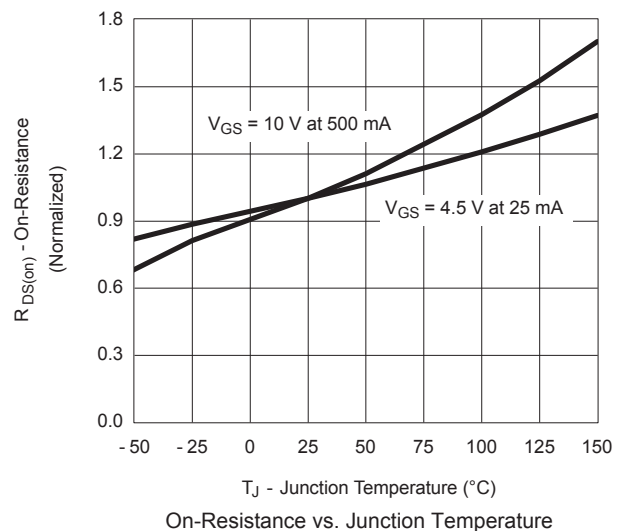
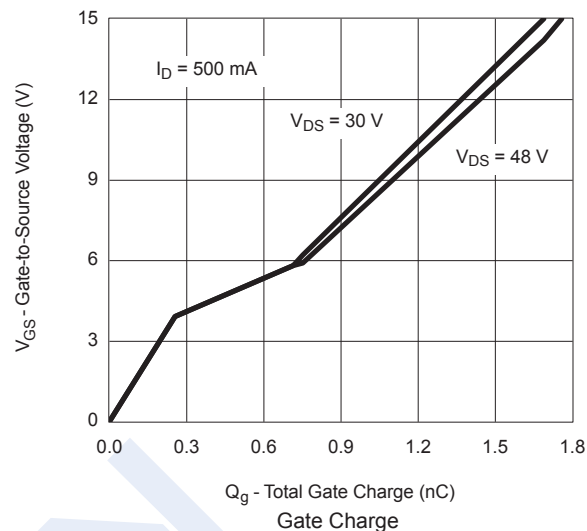
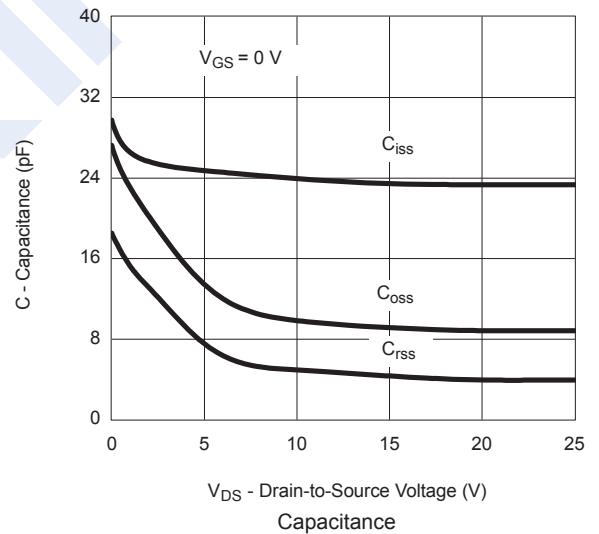
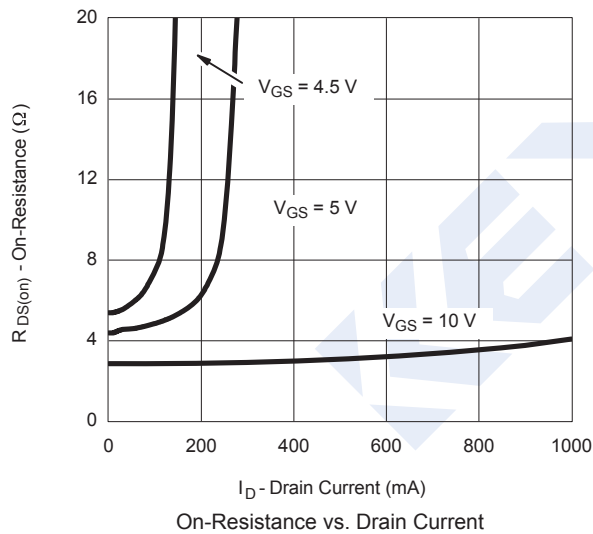
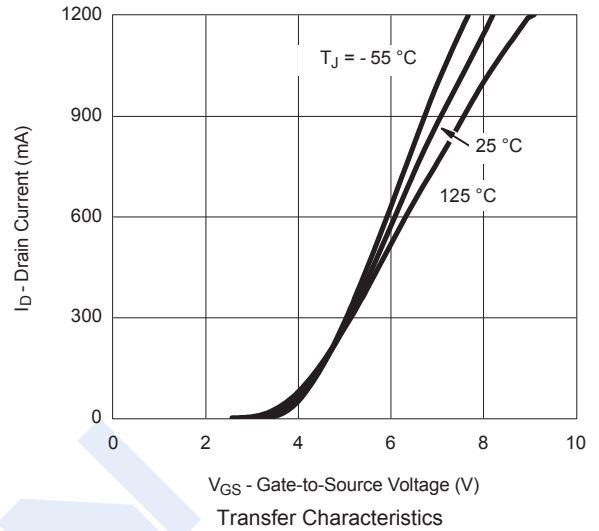
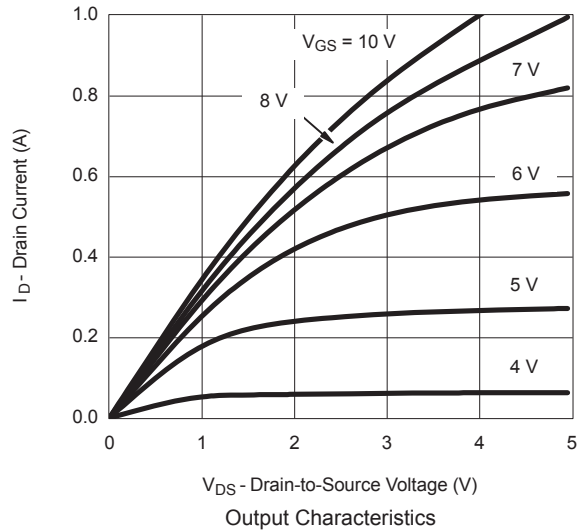
SI1029X

■ N-Channel Typical Characteristics ($T_a = 25^\circ\text{C}$, Unless Otherwise Noted)

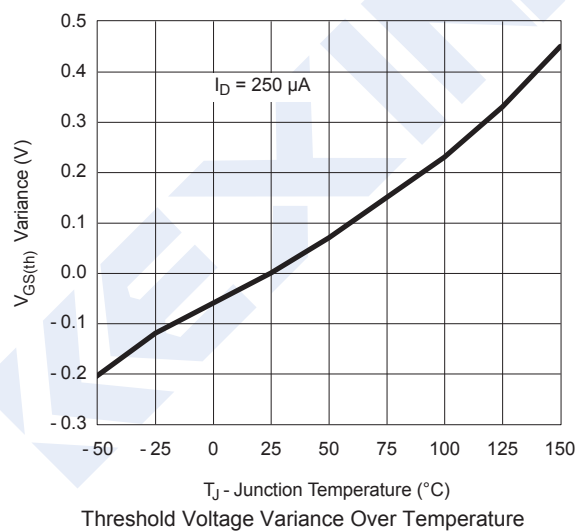
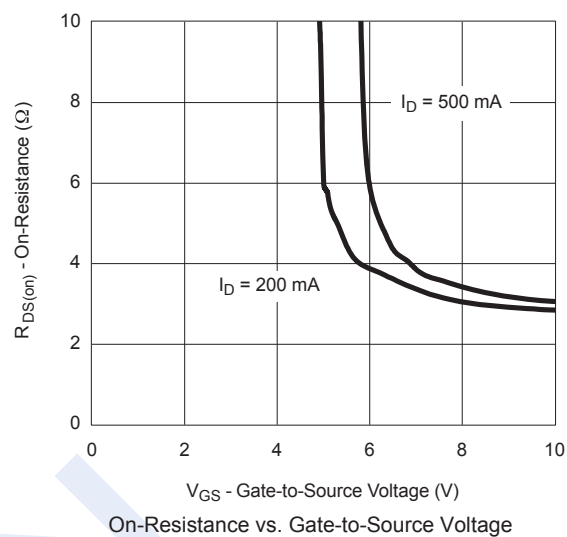
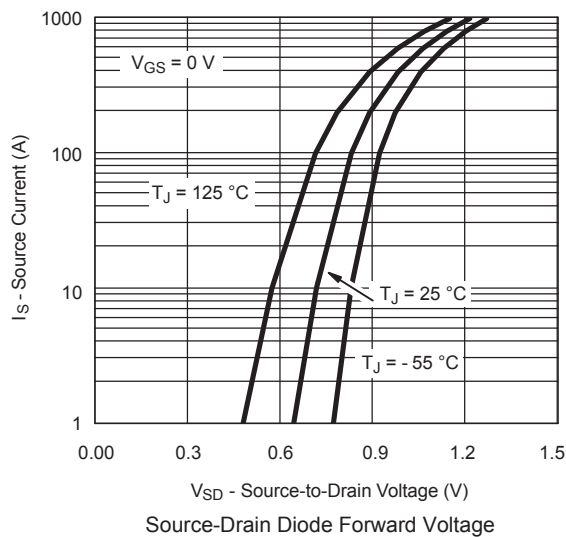
SI1029X



SI1029X

■ P-Channel Typical Characteristics ($T_a = 25^\circ\text{C}$, Unless Otherwise Noted)

SI1029X



■ N or P-Channel Typical Characteristics ($T_a = 25^\circ\text{C}$, Unless Otherwise Noted)

